

What is claimed:

Sub A2>1. A joint comprising:

- 5 a pair of thermoplastic pipes, each of the pipes having an end margin terminating at a pipe end, the end margin of each of the pipes having radially spaced annular first and second walls separated by a void, the first wall of each of the pipes being one of inner and outer walls, the second wall of each of the pipes being the other of the inner and outer walls; and
- 10 an annular coupler having axially opposite end portions, one of the axial end portions of the coupler being positioned between the inner and outer walls of one of the pipes and the other of the axial end portions of the coupler being positioned between the inner and outer walls of the other of the pipes, the coupler engaging the first walls of the pipes
- 15 via an annular interference fit, the coupler being at least partially formed of thermoplastic material and at least one of the axial end portions of the coupler being heat-fused to the end margin of at least one of the pipes.

2. The joint of claim 1, wherein the coupler is dimensioned such that each of the axial end portions of the coupler is radially spaced from the second wall of the respective pipe.

3. The joint of claim 2, wherein the first wall of each of the pipes is the inner wall of the respective pipe and the second wall of each of the pipes is the outer wall of the respective pipe.

Sub A3>4. The joint of claim 1, wherein the coupler has an annular groove formed therein, the joint further comprising an electrical resistance heating element positioned at least partially in the groove of the coupler, at least one of the

- 5 axial end portions of the coupler being heat-fused to the end margin of at least one of the pipes via the electrical resistance heating element.

5. The joint of claim 4, wherein the annular groove of the coupler is arcuate in axial cross-sectional shape and the electrical resistance heating element is a rope-shaped thermoplastic encased wire.

6. The joint of claim 5, wherein the groove winds circumferentially into one of the axial end portions of the coupler and overlaps itself in an immediately adjacent manner, the groove extending to the other of the axial end portions of the coupler where the groove winds circumferentially into the other of the axial end portions of the coupler and overlaps itself in an immediately adjacent manner, the electrical resistance heating element being the sole electrical resistance heating element of the joint and the end margin of each of the pipes being fused to the coupler via the electrical resistance element.

7. The joint of claim 1, wherein each of the axial end portions of the coupler tapers radially in a manner such that the first walls of the pipes are radially deflected as a result of the engagement of the coupler therewith.

8. The joint of claim 1, wherein the coupler is heat-fused directly to the first walls of the pipes.

9. The joint of claim 1, wherein the coupler is heat-fused to the end margins of the pipes circumferentially about the coupler to provide an annular seal between the coupler and the end margins.

Sub A10. A joint comprising:

a pair of thermoplastic pipes, each of the pipes having an end margin terminating at a pipe end, the end margin of each of the pipes having radially spaced annular first and second walls separated by a void, the first wall of each of the pipes being one of inner and outer walls, the second wall of each of the pipes being the other of the inner and outer walls; and

an annular coupler having axially opposite end portions, one of the axial end portions of the coupler being positioned circumjacent the first wall of one of the pipes and the other of the axial end portions of the coupler being positioned circumjacent the first wall of the other of the pipes, the coupler engaging the first walls of the pipes via an interference fit in a manner such that the first wall of the end margin of each of the pipes radially deflects toward the second wall of the end margin of the respective pipe, the radial deflection being greatest at the end of the respective pipe and decreasing with distance from the end of the respective pipe, the coupler being at least partially formed of thermoplastic material and at least one of the axial end portions of the coupler being heat-fused to the end margin of at least one of the pipes.

11. The joint of claim 10, wherein the first wall of each of the pipes is the outer wall of the respective pipe and the second wall of each of the pipes is the inner wall of the respective pipe.

sub art 12. A method of joining thermoplastic pipes, the method comprising:

providing a pair of thermoplastic pipes, each of the pipes having an end margin terminating at a pipe end, the end margin of each of the pipes having radially spaced annular first and second walls separated by a void, the first wall of each of the pipes being one of inner and outer walls, the

second wall of each of the pipes being the other of the inner and outer walls;

10 providing an annular coupler having axially opposite end portions, the coupler being dimensioned in a manner such that one of the axial end portions is positionable between the inner and outer walls of one of the pipes and such that the other of the axial end portions is positionable between the
15 inner and outer walls of the other of the pipes, the coupler also being dimensioned in a manner such that the coupler engages with the first wall of the end margin of each of the pipes in an annular interference fit with the first wall of the end margin of each of the pipes being radially deflected
20 when one of the axial end portions of the coupler is positioned between the inner and outer walls of the respective pipe, the coupler having at least one electrical resistance heating element attached thereto for providing heat to fuse at least one of the axial end portions of the coupler to the end
25 margin of at least one of the pipes when the at least one axial end portion of the coupler is positioned between the inner and outer walls of the respective pipe;

inserting one of the axial end portions of the coupler between the inner and outer walls of the end margin of one of
30 the pipes and the other of the axial end portions of the coupler between the inner and outer walls of the end of the other of the pipes, the coupler radially deflecting the first wall of the end margin of each of the pipes; and

passing an electrical current through the at least one
35 electrical resistance heating element to heat-fuse the coupler to the end margin of each of the pipes in a manner such that the coupler operatively permanently connects the pipes together.

13. The method of claim 12, wherein the step of providing a coupler comprises providing the coupler with a dimension such that each of the axial end portions of the coupler will be radially spaced from the second wall of the

5 respective pipe when the respective axial end portion of the coupler is inserted between the inner and outer walls of the respective pipe.

Sub A6> 14. The method of claim 13, wherein the first wall of each of the pipes is the inner wall of the respective pipe and the second wall of each of the pipes is the outer wall of the respective pipe.

15. The method of claim 14, wherein the step of providing a coupler comprises providing the coupler with an annular groove formed therein, the at least one electrical resistance heating element of the coupler being substantially
5 positioned within the groove of the coupler.

16. The method of claim 15, wherein the annular groove of the coupler is arcuate in axial cross-sectional shape, the at least one electrical resistance heating element of the coupler being at least one rope-shaped, thermoplastic encased
5 wire that is at least partially positioned within the groove of the coupler.

17. The method of claim 16, wherein the annular groove of the coupler winds annularly into one of the axial end portions of the coupler and overlaps itself in an immediately adjacent manner, the groove extending to the other of the
5 axial end portions of the coupler where the groove winds annularly into the other of the axial end portions of the coupler and overlaps itself in an immediately adjacent manner.

18. The method of claim 12, wherein the step of providing a coupler comprises dimensioning each of the axial end portions of the coupler such that each of the axial end portions of the coupler tapers in radial dimension in a manner
5 such that the radial deflection of the first wall of the end

margin of each of the pipes is greatest at the respective pipe end and decreases with distance from the respective pipe end when the axial end portion of the coupler is inserted between the inner and outer walls of the respective pipe.

19. The method of claim 12, wherein the step of providing a coupler comprises providing the coupler with solely one electrical resistance heating element and wherein the step of passing the electrical current through the electrical resistance heating element fuses the coupler directly to the first wall of the end margin of each of the pipes.

Sub A7 20. The method of claim 12, wherein the pair of thermoplastic pipes provided are helical-rib profile wall thermoplastic pipes, the end margin of each of the pipes having at least a portion of helical rib removed to form the void between the inner and outer walls of the end margin of each of the pipes.

21. The method of claim 12, wherein the pair of thermoplastic pipes provided are corrugated profile wall thermoplastic pipes.